920476-904967

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In the application of	:	Philip J. Christian et al.
Serial No.	:	09/991,386
Filed	:	November 13, 2001
For	:	Allocating Internet Protocol (IP) Addresses to Nodes in Communications Networks Which Use Integrated IS-IS
Examiner	:	Victor D. Lesniewski
Art Unit	:	2152
Customer number	:	23644

AMENDED BRIEF ON APPEAL

Honorable Director of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal is from the final rejection of July 15, 2005. A timely Notice of Appeal (with Pre-Appeal Brief Conference Requested) was submitted to the Patent and Trademark Office on November 15, 2005.

The Appeal Brief of $500 was paid on April 7, 2006. An appropriate Extension of Time was also filed at that time. No additional fees are due, but if the Patent and Trademark Office deems any fees due, they may be deducted from Deposit Account No. 12-0913 after authorization by the undersigned.

(i) **Real Party in Interest**

This application is assigned to Nortel Networks Limited. The assignment is recorded at 012325/0376.

(ii) **Related Appeals and Interferences**

There are no related appeals or interferences.

(iii) **Status of Claims**

This application was filed with claims 1 to 20. In the response of January 25, 2005 claims 1, 12, 15, 19 and 20 were amended and claims 17-18 were canceled. Claims 1-16 and 19-20 are the claims appealed.

(iv) **Status of Amendments**

No amendments to the claims were made in response to the final rejection of July 15, 2005, although a response of September 13, 2005 was filed and entered. All the pending claims 1-16, 19-20 as amended during the prosecution of the application are set forth in the Claims Appendix.

(v) **Summary of the Claimed Subject Matter**

The present invention relates to allocating Internet Protocol (IP) addresses to nodes in an Intermediate System to Intermediate System (IS-IS) network.

Independent claim 1:

This claim summarizes the invention conveniently and specifies a method of automatically allocating a unique internet protocol (IP) address to a first node in an integrated intermediate-system-to-intermediate-system (IS-IS) communications network said method comprising the steps of:-

(i) accessing information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) selecting one of the potentially available IP addresses to allocate to the first node; and

(iii) sending information about the selected IP address to nodes in the IS-IS communications network.

IS-IS nodes use ISO addresses. Conventionally, IS-IS nodes are not allocated unique IP addresses. As discussed in the background section of the present application (page 1 lines 17-21), IS-IS nodes may be closely associated with, or integrated with, IP routers which are allocated IP addresses. Thus, there is no need to allocate IP addresses to IS-IS nodes for routing purposes. However, the present inventors realized that allocation of a unique IP address to IS-IS nodes is still useful - not for routing purposes - but for management purposes. For example, a unique IP address allows for IP-based network management applications to be re-used for IS-IS management as well. The present invention provides a way of automatically allocating a unique IP address to an IS-IS node which avoids the need for manual configuration of an address to each IS-IS node.

Figure 1 shows an example Open Systems Interconnection (OSI) network in which the invention can be applied, comprising nodes 11-16. Any of the nodes 11-16 can be allocated a unique internet protocol (IP) address using the method of claim 1. In accordance with a first embodiment, described at page 9 line 12 – page 10 line 17 and Fig. 2, information about one or more available IP addresses is stored at a server in the OSI network (10, Fig. 1). When a new network node (e.g. node 12, Fig. 1) is added to the network, it requests an IP address. The server selects one of the available IP addresses (step 22, Fig.2, page 10 lines 1-8) for allocation to the first node and sends information about the selected IP address to the nodes (11-16) by a

flooding method. IP address information can be carried within an extension (51) of a Link State PDU (LSP), as shown in Fig. 5.

In another embodiment, described at page 10 line 29 – page 11 line 31 and in Fig.3, a network node (e.g. node 12, Fig.1) stores a plurality of pre-specified IP addresses (step 30, Fig. 3) and selects one of those (step 32, Fig. 3). The node informs other nodes about the selected IP address (page 11 lines 29-31), such as by sending LSPs of the type shown in Fig. 5.

Independent claim 12:

This claim has corresponding distinctive features and so the discussion of claim 1 applies here. Claim 12 specifies a server (10, Fig.1) connected to an integrated intermediate-system-to-intermediate-system (IS-IS) communications network (19, Fig.1) and arranged to automatically allocate an internet protocol (IP) address to a first node (12, Fig.1) in that communications network, said server (10, Fig.1) comprising:- (i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted (page 9, lines 18-22); (ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node (page 10 lines 1-8); and (iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes (11-16, Fig.1) in the IS-IS communications network (page 10 lines 1-8).

An embodiment of a server recited in claim 12 is described in the specification at page 9 line 17 – page 10 line 8.

Independent claim 15:

This claim has corresponding distinctive features and so the discussion of claim 1 applies here. Appropriate reference numerals of Fig. 1 and the flow diagram of Fig. 3 correspond to the claim features as follows. Claim 15 specifies a communications

network node (e.g. node 12, Fig. 1) for use in an integrated intermediate-system-to-intermediate-system (IS-IS) communications network and requiring a unique internet protocol (IP) address, said communications network node (12) comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted (step 30, Fig. 3; page 11 lines 6-8);

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node (step 32, Fig. 3; page 11 lines 20-23); and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network (page 11 lines 29-31).

Independent claim 19:

This claim recites an integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a server which has corresponding distinctive features as recited in claim 12, and so the discussion of claims 1 and 12 applies here. Claim 19 specifies an integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a server arranged to automatically allocate an internet protocol (IP) address to a first node in that communications network, said server comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted (page 9, lines 18-22);

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node (page 10 lines 1-8); and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes (11-16, Fig.1) in the IS-IS communications network (page 10 lines 1-8).

An embodiment of a server recited in claim 19 is described in the specification at page 9 line 17 – page 10 line 8.

Independent claim 20:

This claim recites an integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a node which has corresponding distinctive features as recited in claim 15, and so the discussion of claims 1 and 15 applies here. Claim 20 specifies an integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a communications network node requiring a unique internet protocol (IP) address, said communications network node comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted (step 30, Fig. 3; page 11 lines 6-8);

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node (step 32, Fig. 3; page 11 lines 20-23); and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network (page 11 lines 29-31).

(vi) Grounds of Rejection to be Reviewed on Appeal

The following issue is presented:

1. The rejection of claims 1-16, 19 and 20 under 35 USC 103(a) as being unpatentable over Rekhter (US 5,917,820) in view of Wong (US 6,073,178)

(vii) **Argument**

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent and Trademark Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent and Trademark Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985). A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142.

Appellants believe that one skilled in the art: (i) would not be motivated to combine Rekhter with Wong, (ii) would not have a reasonable expectation of

success in combining these references, and (iii) would not, even if he were to combine the references, arrive at all of the limitations of the claims.

Rekhter describes an improved arrangement for quickly and efficiently forwarding packets in a packet-switched network (see abstract, for example). *Rekhter* is not concerned with allocating unique IP addresses as destination addresses for contacting nodes in an integrated IS-IS communications network but with setting up forwarding tables in routers of a packet-switched network so that packets may be forwarded onto the next hop. *Rekhter* aims to increase the speed of a packet forwarding system (336, Fig.4) of a router by reducing the amount of data which needs to be compared at the packet forwarding system. *Rekhter* teaches a short-hand way of referring to particular routes between routers, at a local level. *Rekhter* achieves this by using short, locally-unique, network layer-independent tags to predetermined groups of addresses (see col.9 line 65 – col.10 line 1). The tag values are based on parts of existing addresses which have already been allocated (see col.9 lines 10-14, col. 10 lines 35-37 and the tag database of Fig.5) to those routers. Thus, tags can only be used after a node has been allocated a network layer address (502, Fig.5) and a MAC address (502, Fig.5). The tag in *Rekhter* is not "a unique IP address at which the first node may be contacted" but something shorter and the tag is only locally unique (col.10 lines 26-29, col.11 lines 12-19) rather than being globally unique as in the case of an IP address. The tag in *Rekhter* refers to a route between nodes, rather than uniquely identifying a particular node (col.10 lines 29-34). Also, the tag in *Rekhter* represents a route to a group of addresses. All of these aspects of *Rekhter* teach against the aims of the present invention.

In the Advisory Action mailed September 22, 2005 the Examiner argues that "the combination of Rekhter and Wong discloses an IS-IS communications network" and that "*Rekhter* even states the use of the ISO IS-IS routing protocol." Rekhter does mention the IS-IS protocol at col.11 line 59 – col.12 line 3 as an example of a link state protocol which routers conventionally use. However, this is merely

described as one example of how the tags of *Rekhter* (whose purpose is to locally identify routes between nodes which already have been allocated a network address) can be carried and there is no suggestion, or teaching, of how to allocate a unique IP address to an IS-IS node.

In the Advisory Action mailed September 22, 2005 the Examiner further argues that "*Rekhter,* col.12 lines 20-28, clearly satisfies the limitation for sending information about the selected IP address to nodes in the IS-IS communications network" because "Rekhter states exchanging and advertising tag information with other routers" and that "this tag includes IP addresses or related information." *Rekhter,* of course, exchanges tag information with other routers *Rekhter.* This is how the locally generated tags are shared with other nodes. However, the Examiner is incorrect to state that "this tag includes IP addresses or related information." It does not. The tag information refers to a route between nodes which have already been allocated network level addresses. The tag is providing a short-cut way of referring to a route between nodes which have already been allocated a network address.

Wong describes a network of client systems including a router (106, Fig.1) to monitor the assignment of IP addresses to said client systems by a DHCP server (114, Fig.1). As each IP address is assigned, the router associates the assigned IP address with a trusted identifier which identifies the client system. Subsequently, if the router receives a packet directed at the assigned IP address, the router forwards the packet to the client system having the trusted identifier associated with the destination address of the IP packet. Additionally, if the router receives a packet from a client system, it uses the trusted identifier of the client system to find IP addresses associated with the client system. If the source address of the IP packet is not included in the IP addresses associated with the client system, then the packet is discarded.

Wong makes no mention of IS-IS nodes or IS-IS networks, which the present invention is concerned with. The objective of *Wong* (improving security) and the specific teachings of *Wong* (use of trusted identifiers) are quite irrelevant to those of the present invention. In the Advisory Action mailed September 22, 2005 Examiner argues that "Wong discloses a unique IP address for a specific individual client called a "learned" IP address." *Wong* demonstrates nothing more than IP address allocation was known in IP networks. The existence of IP address allocation in conventional TCP/IP networks is accepted by the Appellants and, indeed, it is described in the background section of the present application at page 2 lines 13-18.

It is clear that *Rekhter* and *Wong*, even when combined, do not teach or suggest all of the limitations of claim 1. For example, neither reference discloses allocating an address to a node in an integrated intermediate-system-to-intermediate-system (IS-IS) communications network nor the step of sending information about the selected IP address to nodes in the IS-IS communications network. Nor do either of *Rekhter* or *Wong* teach or suggest allocating a unique IP address to a node. It is clear from the disclosure of *Wong*, that a client system can have more than one IP address associated with it through its trusted identifier (see abstract and claims of *Wong*). For this reason alone, the Examiner's rejection of claims 1 to 16, 19 and 20 under 35 U.S.C. 103(a) cannot be sustained.

Additionally, one of ordinary skill in the art would not seriously contemplate combining the teachings of *Rekhter* and Wong since *Rekhter* relates to setting up forwarding tables in routers of a packet-switched network so that packets may be forwarded onto the next hop towards their ultimate destination whereas *Wong* is concerned with associating trusted identifiers with IP addresses allocated to client systems by a DHCP server. These references address entirely different technical issues.

Even if one of ordinary skill in the art did contemplate combining the teachings of *Rekhter* and *Wong*, they would then have to go the further step of applying such

combined teachings to an IS-IS communications network in order to arrive at the arrangement of the present invention. Thus, it is clear that the Examiner's rejection of the claims requires the person of ordinary skill to do more than combine the teachings of *Rekhter* and *Wong*. Even if the person of ordinary skill contemplated this further step, which it should be noted takes the person of ordinary skill into the realm of inventiveness, the resultant system would exhibit the very problem that the present invention seeks to address. Namely, that for a new device to be added to the network of the resultant system and automatically assigned an IP address, it must be added so that it is directly connected to a DHCP server. This is problematic for complex networks such as those which comprise a plurality of directly connected routers or other intermediate systems such as an IS-IS communications network as in the present invention. In such cases, new network elements may need to be added so that they are indirectly connected to the DHCP server. However, this is not possible without using a DHCP relay server that is directly connected to the new network element. In order to provide an IP address to such a new network element, the DHCP relay server is used, in addition to the DHCP server itself. The DHCP relay is connected directly to the new network element. This is obviously complex and requires DHCP relay servers to be provided in addition to the DHCP server. The present invention overcomes this problem and thus cannot be considered as being obvious over the combination of *Rekhter* and *Wong*.

Additionally, Appellants can see no reasonable expectation of success in attempting to combine an IP address allocation scheme with improved security (*Wong*) with an arrangement for efficient packet forwarding (*Rekhter*). Appellants find it hard to even hypothesize what expectations one skilled in the art would have were he to envisage such a combinations (which is strongly denied).

Appellants believe that the Examiner has exercised impermissible hindsight reasoning by combining clearly non-analogous references, without any reasonable suggestion or motivation in the art nor any reasonable expectation of success, using the claims of the present application as a template. The references cited seem to

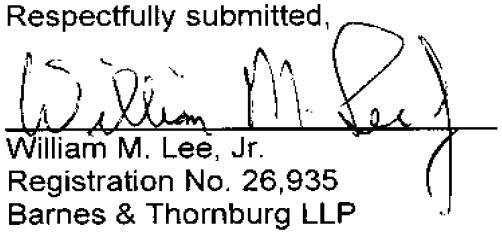
have been selected more for the appearance of "search keywords" than to any relevance to the present invention.

It has been demonstrated above that the present rejection of claims 1 to 16, 19 and 20 under 35 U.S.C. 103(a) does not satisfy any of the three tests necessary to establish a prima facie case of obviousness. Since the initial burden of establishing a prima facie basis to deny patentability to a claimed invention is always upon the Patent and Trademark Office and, if the Patent and Trademark Office does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of a patent.

Accordingly, reversal of Examiner's rejections is respectfully requested.

January 3,2008

Respectfully submitted,



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Claims Appendix

Pending Claims:

1. A method of automatically allocating a unique internet protocol (IP) address to a first node in an integrated intermediate-system-to-intermediate-system (IS-IS) communications network said method comprising the steps of:-

(i) accessing information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) selecting one of the potentially available IP addresses to allocate to the first node; and

(iii) sending information about the selected IP address to nodes in the IS-IS communications network.

2. A method as claimed in claim 1 wherein said information is sent using a flooding method comprising the use of link state PDUs (LSPs).

3. A method as claimed in claim 2 wherein said information is sent using LSP extensions.

4. A method as claimed in claim 1 wherein said information is sent using a flooding method comprising an adaptation of the connectionless network service (CLNS) protocol.

5. A method as claimed in claim 1 wherein said step (i) of accessing information comprises accessing a server connected to the communications network.

6. A method as claimed in claim 5 wherein said information is sent using LSPs with anomalous sequence numbers.

7. A method as claimed in claim 1 wherein said step (i) of accessing information comprises accessing the first node which has pre-specified information about one or more potentially available IP addresses.

8. A method as claimed in claim 7 wherein said step (ii) further comprises receiving information at the first node about the IP addresses of other nodes in the communications network, and selecting one of the potentially available IP addresses on the basis of the received information.

9. A method as claimed in claim 8 wherein said information is received during a specified duration.

10. A method as claimed in claim 1 which further comprises using said selected IP address to access the first node using an Internet Protocol management system.

11. A method as claimed in claim 1 wherein said first node is selected from an intermediate system, a router and an optical multiplexer with integral router.

12. A server connected to an integrated intermediate-system-to-intermediate-system (IS-IS) communications network and arranged to automatically allocate an internet protocol (IP) address to a first node in that communications network, said server comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node; and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network.

13. A server as claimed in claim 12 wherein said output is arranged to issue link state PDU (LSP) messages containing information about the selected IP address.

14. A server as claimed in claim 12 wherein said output is arranged to issue messages according to the connectionless network service (CLNS) protocol which contain information about the selected IP address.

15. A communications network node for use in an integrated intermediate-system-to-intermediate-system (IS-IS) communications network and requiring a unique internet protocol (IP) address, said communications network node comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node; and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network.

16. A communications network node as claimed in claim 15 which is selected from an intermediate system, a router, and an optical multiplexer with integral router.

17-18. (Cancelled)

19. An integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a server arranged to automatically allocate an

internet protocol (IP) address to a first node in that communications network, said server comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node; and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network.

20. An integrated intermediate-system to - intermediate-system (IS-IS) communications network comprising a communications network node requiring a unique internet protocol (IP) address, said communications network node comprising:-

(i) a store comprising information about one or more potentially available IP addresses which may be allocated to provide the first node with a unique IP address at which the first node may be contacted;

(ii) a processor arranged to select one of the potentially available IP addresses to allocate the first node; and

(iii) an output arranged to issue one or more messages containing information about the selected IP address to nodes in the IS-IS communications network.

Evidence Appendix

None.

Related Proceedings Appendix

None.